Kramer Electronics, Ltd.

USER MANUAL

Model:

VM-2HDCP

1:2 DVI Distributor

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer **DigiTOOLS® VM-2HDCP** *1:2 DVI Distributor.*

The **VM-2HDCP** is ideal for:

- Multiple screen applications
- Rental and staging

Each package includes the following items:

- **VM-2HDCP** *1:2 DVI Distributor*
- Power adapter (12V DC Input)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

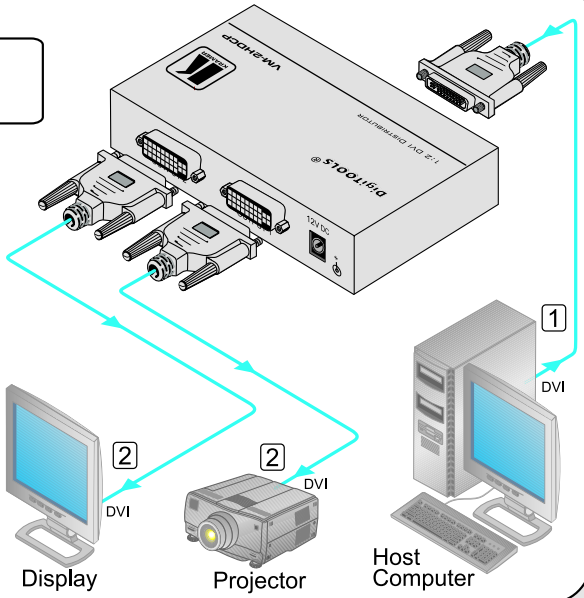
3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

Step 1: Connect the input and outputs - see section 5

1 Connect the input
2 Connect the outputs



Step 2: Turn the power ON

Step 3: Acquire the EDID if required - see section 5.1

ACQUIRE THE EDID

- Connect the power supply
- Connect the new OUT display from which you want to acquire the EDID
- Press and hold the EDID button for more than 3 seconds and release.
  The two OUT LEDs blink alternately
- Press the EDID button again when the appropriate OUT LED lights

To restore the default EDID, disconnect the outputs and repeat the above procedure

ACQUIRE THE CLONE EDID

- Connect the new OUT display from which you want to acquire the EDID
- Disconnect the power supply and then reconnect it while pressing the EDID button
- Release the EDID button when the appropriate OUT LED blinks

3 Overview

The Kramer **VM-2HDCP** is an HDCP (High-Bandwidth Digital Content Protection)[1] compatible 1:2 distribution amplifier for DVI-D (Digital) signals. Since high-resolution DVI signals are very sensitive to cable quality and to PCB layout, the **VM-2HDCP** uses a uniquely designed PCB which includes all buffering, conditioning and amplifying circuitry to provide two high-level output signals.

In particular, the **VM-2HDCP**:

- Distributes signals having resolutions up to UXGA, including all HDTV formats
- Has a bandwidth of 1.65GHz
- Supports the DDWG DVI 1.0 standard
- Consists of a built-in re-clocking block that re-generates the DVI signal, so that several units may be cascaded
- Can read and store, in non-volatile memory, the EDID[2] block from one of the outputs, so it can then provide the EDID information to the DVI source even if the display device is not connected
- Stores a default EDID for fast and efficient connection of the unit[3]
- Has three DVI-I connectors, which are compatible with all types of DVI cables
- Is a cost-effective solution for distributing the TMDS signals used for DVI, and uses state-of-the-art line drivers on both outputs

3.1 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard[4], protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals.

1 Note that Kramer Electronics Limited is an HDCP Licensee, see http://www.digital-cp.com/list/

2 EDID is Extended Display Identification Data

3 The default EDID feature lets you connect the VM-2HDCP without having to connect a display to the output

4 Developed by Intel

3.2 Defining EDID

The Extended Display Identification Data (EDID[1]) is a data-structure, provided by a display, to describe its capabilities to the source. The EDID enables the **VM-2HDCP** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 Recommendations for Best Performance

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances and positioning your **VM-2HDCP** away from moisture, excessive sunlight and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[2].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 Defined by a standard published by the Video Electronics Standards Association (VESA)

2 For example: model number AD2512C, part number 2535-000251

4 Your VM-2HDCP 1:2 DVI Distributor

Figure 1, Figure 2, Figure 3 and Table 1 define the **VM-2HDCP**:

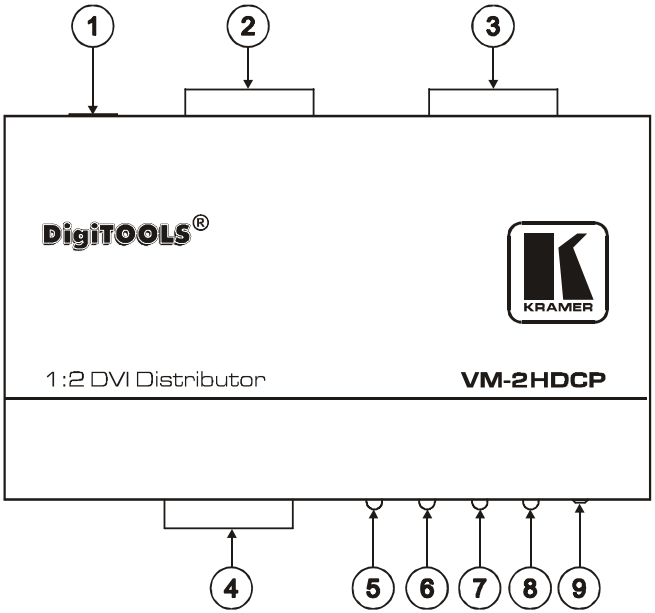


Figure 1: VM-2HDCP 1:2 DVI Distributor

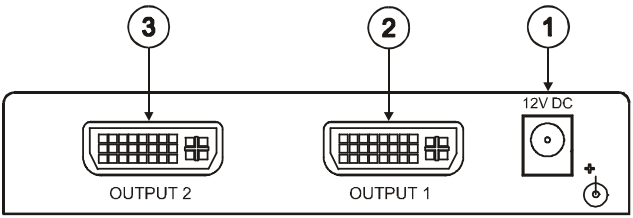


Figure 2: VM-2HDCP (Top Side Panel)

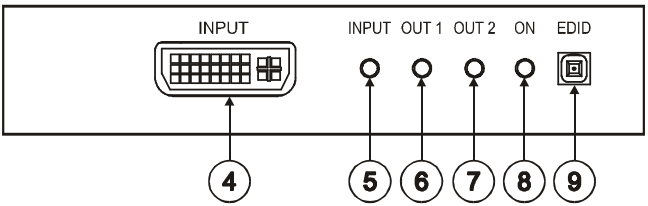


Figure 3: VM-2HDCP (Lower Side Panel)

Table 1: VM-2HDCP 1:2 DVI Distributor Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*OUTPUT1* DVI Connector	Connect to the DVI acceptor 1
3	*OUTPUT2* DVI Connector	Connect to the DVI acceptor 2
4	*INPUT* DVI Connector	Connects to the DVI source
5	*INPUT* LED	Lights when the input is active; blinks when the input is not valid
6	*OUT 1* LED	LED lights when OUTPUT 1 is connected and active; LED blinks when selecting the EDID (see section 5.1)
7	*OUT 2* LED	LED lights when OUTPUT 2 is connected and active; LED blinks when selecting the EDID (see section 5.1)
8	*ON* LED	Lights when the unit is powered
9	*EDID* Button	Press to read the EDID of the selected display (see section 5.1)

5 Connecting a VM-2HDCP 1:2 DVI Distributor

To connect the **VM-2HDCP** as illustrated in the example in Figure 4, do the following:

1. Connect a DVI source (for example, a host computer) to the INPUT connector.
2. Connect the OUTPUT connectors[1] to one or both DVI acceptors, as follows:
   - OUTPUT 1 connector to DVI acceptor 1 (for example, a projector)
   - OUTPUT 2 connector to DVI acceptor 2 (for example, a display)
3. Connect the 12V DC power adapter (wall transformer) to the 12V DC socket and connect the transformer to the mains electricity.
4. Acquire the EDID (see section 5.1).

1 Both outputs do not need to be connected

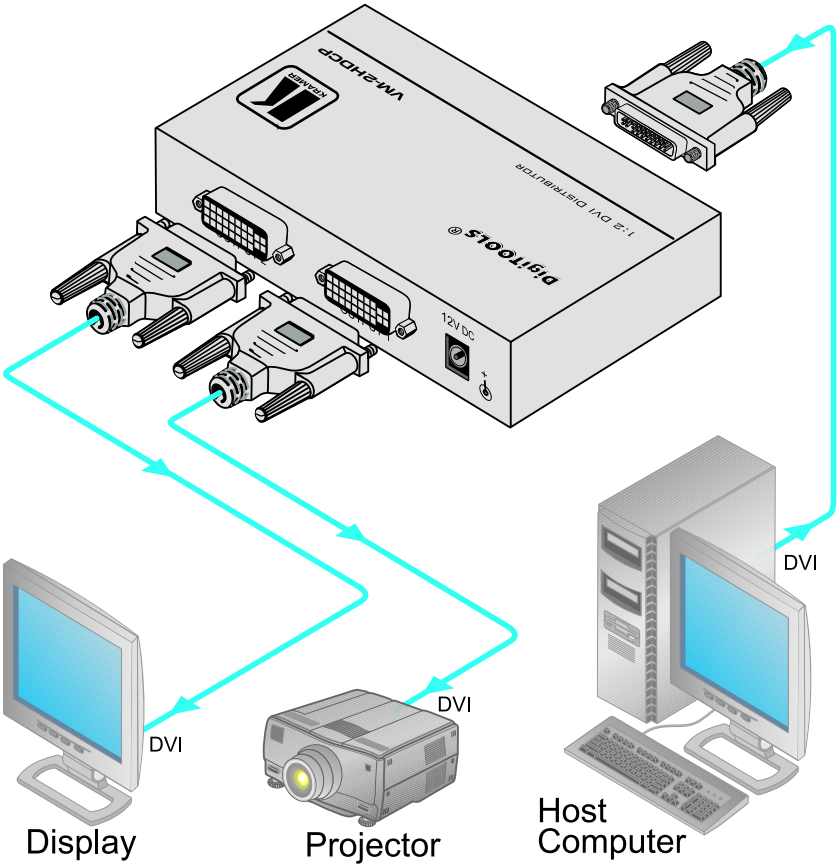


Figure 4: Connecting a VM-2HDCP 1:2 DVI Distributor

5.1 Acquiring the EDID

Initially, the **VM-2HDCP** operates with the factory default EDID[1]. This lets you connect the power before connecting either of the acceptors or the source.

You can acquire:

- The Default EDID (both output LEDs blink)
- The EDID from One Output (the relevant output illuminates)

You can also acquire the Clone EDID which copies the EDID data from the acceptor bit-by-bit.

5.1.1 Acquiring / Changing the EDID

You can work with the default EDID or acquire or change an EDID via one of the connected outputs. Use the EDID Setup button to acquire the output EDID information.

To acquire or change the EDID of a new output display:

1. Connect the power supply.
   The ON LED lights.
2. Connect the new output display device.
3. Press and hold the EDID button for more than three seconds and release.
   The INPUT LED blinks and the OUT 1 LED and OUT 2 LED blink alternately.
4. Press the EDID button again when the appropriate OUT LED lights, that is, to copy the EDID from the display connected to the DVI:
   - OUT 1 connector, press the EDID button when the OUT1 LED is on
   - OUT 2 connector, press the EDID button when the OUT2 LED is on

   In either case, the **VM-2HDCP** copies the EDID from the display. If no display is connected to the selected DVI output, the default EDID will be chosen.

Note that during the EDID setup, the respective OUT LED blinks. When that output is connected, that OUT LED illuminates

1 The VM-2HDCP reads the EDID, which is stored in the non-volatile memory

5.1.2 Acquiring the Clone EDID

To acquire the Clone EDID, do the following[1]:

1. Connect the new output display device (for example, to OUT 1).
2. Disconnect the power supply.
3. Reconnect the power supply while pressing the EDID button.
   The ON LED lights and the OUT 1 and OUT 2 blink alternately.
4. Release the EDID button when the OUT 1 LED blinks.
   The Clone EDID is stored in the non-volatile memory when the OUT 1 LED ceases to blink.

6 Technical Specifications

Table 2 includes the technical specifications:

Table 2: Technical Specifications[2] of the VM-2HDCP 1:2 DVI Distributor

INPUT:	1 DVI, 1.2Vpp on a DVI Molex 24pin female connector; DDC signal 5Vpp (TTL)
OUTPUTS:	2 DVI, 1.2Vpp on DVI Molex 24pin female connectors; DDC signal 5Vpp (TTL)
BANDWIDTH:	1.65Gbps
CONTROLS:	EDID button for selecting and storing EDID information
POWER SOURCE:	12V DC. 180mA
DIMENSIONS:	12.1cm x 7.18cm x 2.42cm (4.76” x 2.83” x 0.95”, W, D, H.)
WEIGHT:	0.28kg (0.62lbs) approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	Kramer DVI cables[3]

1 This example refers to OUT 1. The same applies for OUT 2 if the acceptor is connected to OUT 2

2 Specifications are subject to change without notice

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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